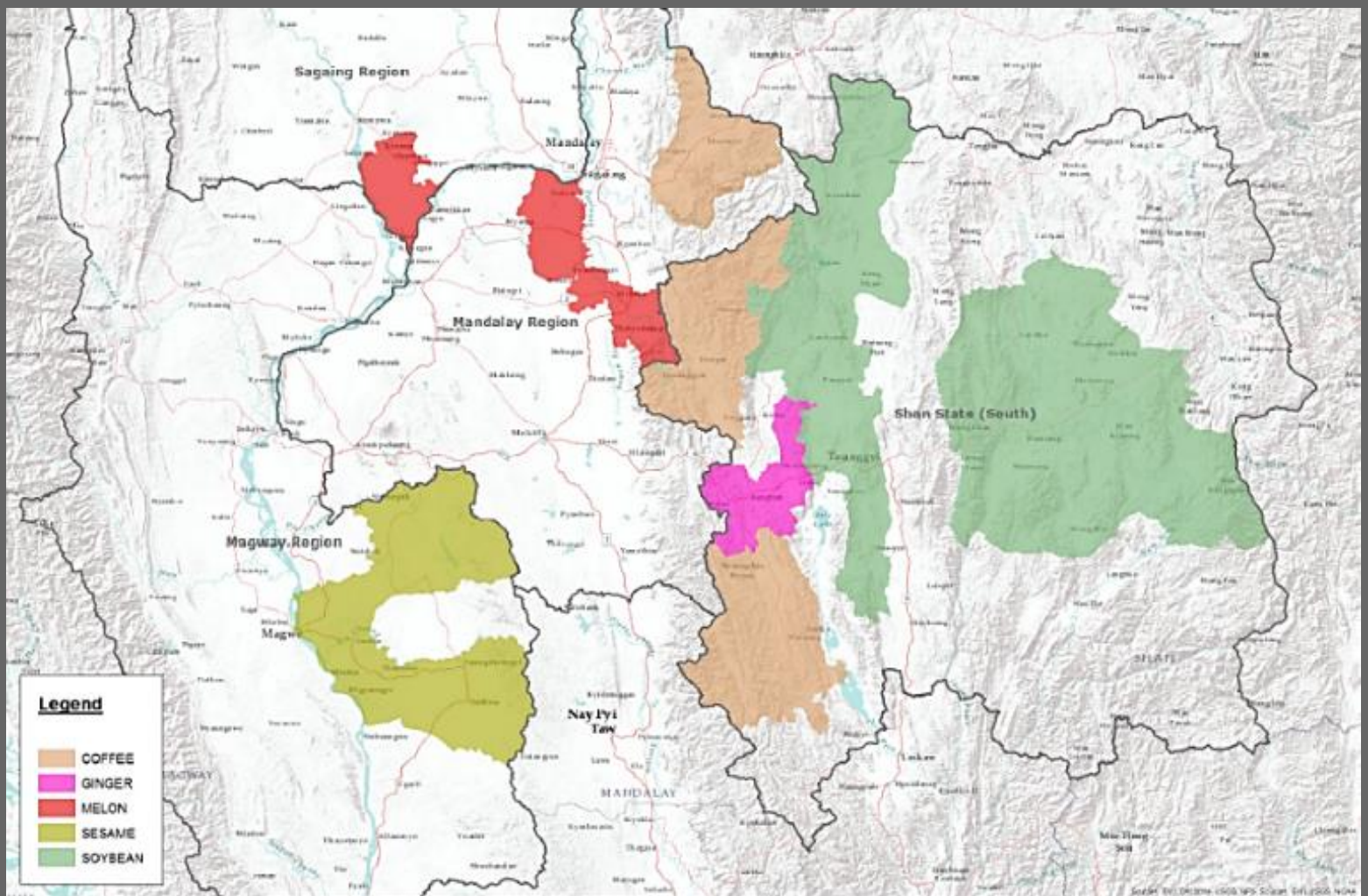




USAID
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ANNUAL REPORT

VALUE CHAINS FOR RURAL DEVELOPMENT PROJECT



Above: The Value Chains for Rural Development project expanded the reach of its activities in Fiscal Year 2016 in the Dry Zone and Shan State, reaching smallholder farmers in more than 260 villages in 18 townships in the coffee, soy, ginger, sesame and melons value chains.

Year Two: October 2015 – September 2016

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DISCLAIMER

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

ACRONYMS

AMIA	Agriculture Market Information Agency
CAEXPO	China-ASEAN Expo
CBO	Community Based Organization
CQI	Coffee Quality Institute
EM	Effective Micro-organisms
EMMP	Environmental Mitigation and Monitoring Plan
F2F	Farmer-to-Farmer
FFD	Farmer Field Days
FFS	Farmer Field Schools
FTF	Feed the Future
FY	Fiscal Year
GAP	Good Agricultural Practices (generally accepted best practices, <i>not GAP certification</i>)
GBE	Green Bean Equivalent (coffee green bean)
ha	Hectare
IPM	Integrated Pest Management
IR	Interim Result
kg	Kilogram
lb	Pound
LFA	Local Field Assistant
LOP	Life of Project
MCA	Myanmar Coffee Association
MCG	Mandalay Coffee Group
MD	Man Day
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
MFVP	Myanmar Fruit, Flower and Vegetable Producers and Exporters Association
MIID	Myanmar Institute for Integrated Development
MT	Metric Ton
NGO	Non-Governmental Organization

OAL	Organic Agroland Co.
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PSA	Public Service Announcement
Q1	Quarter One (Q2 = Quarter Two, etc.)
SARA	Sustainable Action for Rural Advancement
SIMA	South East Asian Agri-Business Show
TOT	Training-of-Trainers
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USD	United States Dollars
USG	United States Government
VC-RD	Value Chains for Rural Development
Y2	Year Two (Y3 = Year Three, etc.)

INTRODUCTION

The United States Agency for International Development in Burma (USAID/Burma) awarded Winrock International a Cooperative Agreement on Sept. 22, 2014 for the Value Chains for Rural Development (VC-RD) Project. This project is part of the Global Presidential Initiative, Feed the Future (FTF), and is supported and overseen by USAID/Burma. The project is implemented in collaboration with sub-awardees Internews and the Coffee Quality Institute (CQI), and through agreements with local partner organizations and private sector enterprises, including Shwe Danu, Lilypad, Mandalay Coffee Group (MCG), Myanmar Fruit, Flower and Vegetable Producer and Exporter Association (MFVP), Myanmar Institute for Integrated Development (MIID), Sustainable Action for Rural Advancement (SARA) and Ywangan Amayar Company.

The VC-RD project builds on Winrock's existing Farmer-to-Farmer (F2F), volunteer-based platform for agriculture technical assistance to support USAID/Burma's goal of supporting inclusive smallholder agriculture modernization and decreasing poverty. The overall goal of VC-RD is to sustainably reduce poverty and hunger in Burma by improving smallholder productivity and profitability, strengthening value chain linkages and competitiveness, and increasing private sector engagement to support value chain upgrading.

Per the Cooperative Agreement (Section A.5 2.2), Winrock is required to submit an annual report one month after the end of each Fiscal Year (FY). This report describes accomplishments and progress during Year Two (Y2) of FY 2016 as compared to the targets and FY 2016 Annual Work Plan. This report covers work completed over the period from Oct. 1, 2015 through Sept. 30, 2016.

General Context and Approach

In FY 2016, in consultation with USAID, the cooperative agreement was modified to simplify the results framework, reducing the number of Interim Results (IRs) from three to two, to focus resources on two major themes: 1.) improved agricultural productivity; and 2.) increased market access and trade.

VC-RD follows a value chain approach to identify farmers' constraints to prioritize activities to improve smallholder agriculture productivity and access to markets. Interventions in productivity focus on enhancing availability and accessibility of agricultural technologies including inputs, strengthening producer groups and organizations, and improving access to quality extension and advisory services. Interventions under market access focus on understanding the dynamics of selected value chains through analysis and competitiveness strategy development, using lead firms where possible and strengthening efforts that support value chain upgrading and investment.

In accordance with the cooperative agreement, VC-RD expanded its geographical coverage in Y2 to include both Southern Shan and the Dry Zone. By the end of Y2, VC-RD identified and developed interventions in five value chains. In Southern Shan, these include specialty coffee, soybeans, and ginger. In the Dry Zone, the value chains include sesame and melons.

To carry out its work, VC-RD engages important international and local partners. In coffee, VC-RD works closely with CQI, an international non-profit that provides both international coffee experts and volunteers, as well as local partner Shwe Danu, a self-help group able to communicate in local languages to conduct farmer-level trainings. In sesame, VC-RD is teamed up with SARA, a local non-governmental organization (NGO) based in Magway, in the Dry Zone. In the melon value chain, VC-RD engaged MFVP to take the lead in organizing and providing training to melon farmers. In ginger, VC-RD works closely with MIID, a local NGO working in Shan State.

VC-RD is organized into specific value chain teams with support from senior team leaders and technical staff. This approach allows the project to achieve inclusive agricultural growth by identifying value chain specific constraints and market based solutions. Examples taken from VC-RD experiences are important for other projects including the FTF Innovation Lab for Food Security Policy: Burma, implemented by the Michigan State University and the Private Sector Development Activity implemented by Nathan Associates, that are working on policy constraints and which require evidence-based data to support their policy change agendas. VC-RD is working closely with these two programs to share experiences. Below, this report presents some of the “big picture” outputs and outcomes of the project’s work in Y2.

Y2: THE BIG PICTURE

In Y2, VC-RD substantially increased the scope and reach of its activities in support of smallholder farmers. VC-RD **reached a total of 16,996 farmers across all five value chains during the year.**

In all, the **project conducted field testing and transfer of a total of 42 new/improved innovative technologies** and practices designed to improve yields and/or improve product quality across the value chains, including introducing new varieties and improved seeds, sundried processing (coffee); grain dryers (soy); contour planting (ginger); soil fertility testing (sesame) and improved plant nutrition (melons)¹. These were tailored by value chain to meet the needs of farmers based on crop type, geography, weather/season and market demand. Because value chains reside within varying farming systems, interventions often impact on multiple crops and multiple stakeholders. VC-RD’s work therefore goes well beyond the value chains selected.

Although most commercial fertilizers and other inputs such as hybrid maize seed are readily available, seeds of self-pollinated crops such as soybean are not. The project supported efforts to encourage the private sector to work with all stakeholders, including relevant government agencies, to ensure sufficient quantities of foundation seed are available for reproduction. VC-RD supported seed multiplication efforts in soy and sesame and promoted improved seed storage technologies; the project also sponsored a melon seed forum to encourage the private sector to advocate for improved seed policy.

The project utilized a variety of extension models during the year to achieve maximum penetration and uptake. For example, in coffee, the project provided training and oversight to a highly capable community based organization (CBO), Shwe Danu, whose trainers have become **expert teachers of simple but innovative practices** that can significantly improve the quality and value of coffee produced by smallholders in Shan. In the soy value chain, the project trained and supervised a network of 10 Local Field Assistants (LFAs), independent contractors who are familiar with the local agricultural landscape and who have developed expertise in soybean production practices and technology. In the Dry Zone, the project worked through partners MFVP (melons) and SARA (sesame) to identify capable lead farmers interested in undergoing intensive training-of-trainers (TOT) on Generally Accepted Best Practices (“GAP”) methodologies, and who are committed to disseminating knowledge to other farmers through demonstration events and other activities.

On the private sector side, **the project facilitated a total of \$1.4 million in private sector investments during the year**, primarily in the coffee, soy, and ginger value chains. This investment went mostly to upgrade processing facilities

¹ For a comprehensive listing of all technologies/practices by value chain, please refer to the individual “On-Farm/Off-Farm Innovations” tables, embedded in each section, below.

and equipment, including a new coffee dry mill for a lead firm in Pyin Oo Lwin and investments in new or upgraded machinery purchased by tofu processors. These investments strengthened individual value chains and supported income growth for smallholder farmers by creating increased demand for their higher-quality products.



VC-RD sponsored the first agriculture trade festival in Southern Shan's history with partner MFVP in June 2016. The festival drew thousands of smallholder farmers, connecting them to input and equipment suppliers, processors, traders and other value chain stakeholders. Above: a crowd gathers at the festival to listen to a Winrock Farmer-to-Farmer volunteer talk about fruit grafting techniques.

Y2 also marked the project's first successful facilitation of improved access to finance for smallholder farmers, linking a pair of lead coffee processing firms directly to smallholders for **micro-loans totaling more than \$25,000** that resulted in the first-ever export sale of smallholder-grown specialty coffee to the U.S. In the soybean value chain, a major tofu processor entered into new purchase agreements for 34 Metric Tons (MT) of soy worth \$21,000 with farmers producing improved quality soy as a result of new technologies introduced by the project². These examples indicate that the project's strategy of providing training and technologies that result in increased quality and improved processing systems can help smallholders successfully compete in lucrative new markets.

The project also expanded its gender programming with partner CQI, launching a "Partnership for Gender Equity" late in Y2 aimed at increasing women's involvement as business leaders in coffee³. VC-RD formalized its relationship with a gender and

coffee quality "champion" who runs a family-owned coffee processing business that received an Innovative Grant award for the purchase of improved processing equipment. This pioneering, woman-led coffee firm will supervise a cluster of five smallholder coffee producing villages to produce sundried natural coffee for export for the upcoming 2016/17 coffee harvest. The gender work in coffee is designed to **provide a model for similar efforts to build gender equity and elevate the role of women** as business leaders in the other value chains.

Value Chains: By the Numbers (Y2):

Coffee

- **4,667 smallholder coffee producers** and **10 processors** learned new coffee farming and processing best practices including coffee farm establishment and rejuvenation; how to build drying tables; sundried natural processing; wet processing and coffee defect identification. Trainings included separate modules on coffee plant health and compost making to ensure trees remain productive during harvest, enabling Burma coffees to meet international specialty coffee standards.

Soybean

² This deal between Nike and soy producers originally was reported in the Q2 FY 2016 Progress Report.

³ Gender activities in the coffee value chain with CQI are scheduled to begin in Q1 of Y3.

- **6,070 smallholder soybean farmers** gained knowledge about locally adapted soybean varieties and access to new technology including flat-bed grain dryers, airtight storage bags, hand seeders and Rhizobium inoculant through innovative extension methods, including a total of **72 Farmer Field Days** (FFDs) held at demonstration plots in both dry and monsoon seasons. These sessions helped smallholder farmers understand how to improve production, processing and overall quality with the goal of tapping new/growing domestic markets.

Ginger

- **1,347⁴ ginger farmers learned** how to make and use natural fertilizers to better maintain soil health and productivity on ginger farms and reduce dependence on chemical inputs in the Inle Lake watershed region. **Three new ginger demonstration farms** were established that enabled the project to introduce **5 practices/technologies** targeting **515 households**.

Sesame

- **989 sesame farmers learned new and improved practices** and strategies to improve sesame plant health and yields during **50 Farmer Field School (FFS) trainings** in **33 villages** covering topics including alternative plant nutrition; plant placement and timing and pest management. The project's partner, SARA, also established **4 new sesame demonstration/trial plots** to continuously demonstrate these practices and technologies including field selection, fertilizer application and rates, plant spacing, soil testing and others.

Melon

- **1,859 melon farmers gained knowledge of GAP** standards during training in **24 villages** in the Sagaing and Mandalay regions. These GAP trainings in **7 townships** were conducted over a total of **30 training sessions** that exceeded goals due to extremely high interest amongst melon farmers to learn about food safety regulations, safe use of inputs, and other GAP content.

Extension & Outreach

- **22 agriculture feature stories and market information reports** broadcast on a national FM radio station, with support from sub-awardee Internews, reaching an audience of millions of listeners **across 7 states with reporting** on agriculture market pricing, trends and the outlook for both specialty and commodity products including sesame, melon, ginger, soy, coffee, mango, avocado, rice, tomato, and tea, among others.

In Y2, VC-RD made substantial progress under the major results as well as most of the sub-IRs and activities delineated in the FY 2016 VC-RD Work Plan. The main technical sections of this annual report are presented by value chain rather

⁴ Of this total, 380 farmers were trained on compost making and soil conservation directly by VC-RD while 786 farmers received training on a variety of ginger marketing and cultivation practices in Lanmangkwe; this total includes 74 farmers who attended FFDs at ginger plots and 107 participants of safe pesticide use and handling trainings conducted in Y2.

than by IRs to better showcase the achievements in each value chain. Each section focuses both on the “on-farm” significant milestones and/or accomplishments as well as “off-farm” innovations or achievements on the processing, market-building and private sector side, for each value chain. The project identified interventions that share similar constraints or issues with one or all of the other value chains (such as activities related to food safety and gender). Rather than present these activities in a separate section, cross-cutting activities are embedded sections on specific value chains, where relevant.

The table included as Annex 2, at the end of this document, illustrates progress compared to indicator targets in Y2 as measured by the project's Monitoring, Evaluation and Learning (MEL) team.

Y2 ACCOMPLISHMENTS -- BY VALUE CHAIN

THE COFFEE VALUE CHAIN

STRATEGY:

The project's strategy in the coffee value chain is to shift Burma from a producer of low-grade commodity coffee to a producer of high-value specialty coffees that can be sold in global and domestic markets.

INTERMEDIATE RESULT 1: AGRICULTURAL PRODUCTIVITY IMPROVED

In Y2, VC-RD expanded efforts to bring smallholder farmers in Burma's highlands Arabica region⁵ up to internationally accepted best practices. VC-RD trained **4,082 farmers⁶** and **10 processors** on best practices related to coffee plantation establishment, management and rejuvenation, building drying tables, sundried natural processing, wet processing, and defect identification.

To scale up activities, VC-RD organized six TOT events throughout the year for key partners. Participants included members of the VC-RD' coffee program team, Shwe Danu trainers, and trainers from Lilypad, a social enterprise operating in Pinlaung. These lead extensionists learned how to build drying tables, properly dry process coffee through sundried natural techniques, conduct washed (wet) coffee processing using hand pulpers, visually recognize coffee defects, properly roast coffee, recognize defects through tasting and conduct trainings on plantation and nursery establishment.

Follow-up assessments of these trainings indicated that **84 percent of participants had adopted at least one new technology**. The most frequently adopted new practices include selective picking of only ripe/red coffee cherries, planting new seedlings and properly performing pest control (mostly dealing with stem borers). This is very encouraging, considering that VC-RD has only been fully involved in coffee value chain activities for one complete harvest cycle.

⁵ Ywangan Township in Southern Shan is the center of smallholder Arabica coffee production; the Pyin Oo Lwin region of Mandalay Division is where most large Arabica coffee estates are located.

⁶ 780 of the 4,082 farmers attended training sessions that covered at least two of the above practices.

Major On-Farm Activities to Strengthen the Coffee Value Chain in Y2

Training Ywangan Farmers on Sundried Natural Processing Techniques

In Y2, the project focused on introducing coffee drying tables using locally available material including bamboo and plastic mesh, with the goal of drying cherries faster, more uniformly and reducing potential for fermentation and mildew. On their own initiative, **resourceful smallholders developed at least four new prototype tables**, crafting customized improvements to make drying racks cheaper and more effective. This basic and affordable new technology immediately

Coffee Technology Dispersion: In Y2, news about VC-RD's activities in support of coffee farmers in Ywangan prompted representatives from a social enterprise, Lilypad, located in Pinlaung (south of Ywangan), to request to participate in upcoming VC-RD/Shwe Danu coffee trainings. After attending TOTs and coffee market linkage events, Lilypad began working with four communities in the Pinlaung area, (Htee Ta Maung, Htar Ngo, Pane Ne Gone and War An) to produce sundried naturals using VC-RD guidelines. Lilypad has since successfully applied for an Innovative Grant to obtain new dry and wet mill machinery to expand its specialty coffee production.

helped improve the quality and value of Arabica coffee produced in the Shan highlands by reducing susceptibility to mildew and enabling farmers to better protect cherries and better control moisture.

VC-RD also provided training on all aspects of dry natural processing and how to recognize major coffee defects both visually and by taste. The project designed and produced text and video-based extension materials in Burmese language. One of the main takeaways is that processing dry naturals at the village-level should take place only in a highly-organized manner by committed and motivated producer groups willing and able to reach a critical mass of at least 1 MT of green bean each -- enough to interest serious specialty coffee buyers.

The project's strategy for Y3 is to engage and support additional organized communities that can commit to scaling up/producing adequate volume by working collaboratively.

Training Coffee Farmers on Improved Practices

VC-RD developed a set of recommended practices for producing high quality coffee including:

- Pruning of mature trees;
- Pruning without stumping or severe cutting;
- Planting of new trees from seedling bags;
- Shade regulation;
- Appropriate plant spacing;
- Applicable commercial fertilizers with micro-nutrients; and
- Soil and plant tissue testing.

The project rolled out trainings across a large number of villages. This strategy helped VC-RD establish strong relationships with growers and other stakeholders in the area. It also helped staff identify farmers who could serve as potential leaders and assist in gathering additional information on current practices, knowledge gaps and needs expressed. Some early data on adoption rates include:

- **705** farmers pruned around **10,000** coffee trees;
- **1,595** farmers applied compost; and
- **1,600** farmers planted **300,000** new coffee trees.

INTERMEDIATE RESULT 2: MARKET ACCESS AND TRADE INCREASED

Major Off-Farm Activities in Y2 in Support of the Coffee Value Chain

VC-RD supported a pilot specialty coffee activity that focused production of sun dried natural coffees by five Ywangan communities. Focusing on specialty coffee and quality is a sustainable way to boost incomes for smallholder producers. In total, the project facilitated the export of 36 MT of specialty coffee with a sales value of \$232,700 to Atlas Coffee Importers, based in the U.S. Additional export sales of high-quality Arabica from Burma coffee estates in FY 2016 to Switzerland and Taiwan indicate that VC-RD's strategy of focusing on quality is beginning to pay dividends.

As part of this pilot activity, **VC-RD helped to successfully identify new sources of working capital** for the community pilot activities. The MCG provided a loan of at a low interest rate, while a pair of Ywangan-based processors provided additional financial support for purchases of ripe cherries and other costs for Coffee Working Group leaders in the communities.

The project and CQI coordinated with the Myanmar Coffee Association (MCA) on the first "New Origin/Buyers' Tour" to introduce seven American coffee importers and roasters and one buyer from New Zealand, along with the publisher of *Roast* magazine⁷, to meet with Burma coffee producers and tour farms in Ywangan and Pyin Oo Lwin.

CQI organized informal coffee cupping (analysis) sessions for these potential buyers in different areas. The verdict was clear, with coffees from all five of the Ywangan communities -- as well as the Pinlaung communities -- performing extremely well. Buyers later remarked how infrequent it is for a "new" origin to move from historically selling uniformly low-quality, commodity coffee to producing and processing specialty grade dry naturals in just one season.

In April 2016, Burma coffee was introduced formally for the first time on a truly global stage at the Specialty Coffee Association of America Expo in Atlanta – the world's largest annual specialty coffee trade event, at a cupping event attended by a crowd of more than 150 specialty coffee experts, entrepreneurs, traders and industry insiders.

At this event, the owner of Atlas Coffee Importers, who had attended the Burma buyers' tour in February, agreed to purchase nearly all of the top-scoring smallholder coffees from both Ywangan and Pinlaung (for a total of 10 MT). **Atlas also purchased an extra 26 MT of estate-grown green bean** through MCG, for a total of 36 MT of certified specialty grade Burma green coffee – enough to fill two shipping containers.

To achieve 10 MT of smallholder-produced green beans⁸, the communities purchased approximately 50 tons of red coffee cherries from their members. To assure the highest quality cherries, communities paid premium prices for fresh cherry. Following the processing and sale of the sundried green beans to the U.S. importer, farmers received an additional bonus,



Stacy Bocskor, a green bean buyer for Allegro Coffee Co. of Colorado, (supplier of Whole Foods Market), meets a farmer in Southern Shan during the first coffee "New Origin/Buyers' Tour" in Burma, arranged by VC-RD with CQI in 2016.

⁷ The *Roast* magazine representative came to Burma as a volunteer under the project, as did other members of the buyers' tour.

⁸ To produce 1 kg of green bean requires approximately 5 kg of fresh cherries.

providing these farmers with 35-50 percent more income than they would have received if they had sold their cherries to the local market or to brokers.

In Y2, coffee producing communities engaged MCG (on a service contract) to provide dry mill services and to prepare the coffees for final shipment. VC-RD worked closely with MCG on the final dry milling of the smallholder coffees and to prepare the containers for shipment. This required careful monitoring of the final product to ensure that the shipment met buyer specifications. The project also provided training on how to meet U.S. customs and food safety requirements for products entering the U.S. This included helping MCG to register their processing facility on the U.S. Food and Drug Administration website and to request the Prior Notice documentation required before shipping to the U.S.

The completion of this historic export deal **brought instant global exposure and credibility to a previously unknown coffee producing origin**, sparking desire amongst smallholders to increase quality and production in the coming harvests to improve their own livelihoods. It also resulted in inquiries from several organizations in the region, including Mu Di Tar Foundation, GreenGolden Coffee Farmer Cooperative and World Vision, for VC-RD support to initiate specialty coffee production⁹. As a result, the project plans to significantly expand coffee interventions in Y3 and to expand into Pindaya Township.

In Y3, the project will scale up the community coffee activity with a goal of achieving 80 MT (GBE) with an estimated market value of nearly \$550,000. To meet that goal, late in Y2 VC-RD assessed the production capacity and organizational strengths of more than two dozen coffee producing villages now interested in producing specialty coffee using sundried processing techniques, and in Y3 will directly support 23 villages with the capacity to produce high quality Arabica¹⁰.

Promoting a Domestic Specialty Coffee Market

In addition to its export market support, VC-RD worked with MCA and the domestic roasting and brewing industry to introduce Burma specialty coffees into the domestic market. In recognition that not all coffees will be exported as specialty, the strategy is to strive for the highest quality achievable as the primary objective, and commodity grade coffee as a by-product rather than a goal. The domestic market offers a good opportunity for both specialty and improved coffees. There is also a market for lower quality coffees in the instant coffee segment.

With support from the project, **MCG procured over \$480,000 worth of fresh coffee cherries in Y2** from smallholder producers in Southern Shan, marking the first time this new private sector processor/buyer purchased in aggregate directly from farmers. Now that MCG's processing facilities are fully functional and meet international standards, this lead firm plans to supply quality Arabica green beans to local roasters and export to foreign countries. MCG is now positioning itself as a domestic coffee supplier with consistent quality and reliable supply. This firm will not only act as a leading processor on behalf of smallholders, but also serve as a bridge between the coffee farmers and end-markets, tackling the current problem of inconsistent quality of red cherries.

⁹ Prospective coffee production expansion areas include Tashileik and Keng Tung with World Vision; Loilen and Hobong with GreenGold Cooperative; Kyauktalone Gyi with Mu Di Tar; and Pindaya with Shwe Danu.

¹⁰ More details about this planned expansion are provided in VC-RD's FY 2017 Annual Work Plan, submitted in October 2016.

Building National Coffee Quality Control Capacity

Describing coffees through cupping is the lexicon of the global coffee industry. Currently, no formally trained or certified Q cuppers exist in Burma. As a result, the national coffee industry relies only on the assessments and opinions of buyers to assess the value of their coffee, putting producers, processors and traders at a distinct disadvantage.

To begin to address this critical issue, VC-RD carried out a series of “Pre-Q”¹¹ training courses in Pyin Oo Lwin and Rangoon. Eighteen participants including estate and café owners and processors undertook a series of three intensive, two-day training courses in Y2; a fourth course is scheduled for Q1 of Y3. Through the Pre-Q training course, VC-RD will identify and begin training the country’s most skilled and motivated cuppers with the goal of inviting them to participate in a certified, full Q Grader training course to be held in Burma in Y3.

Table 2, below, provides a comprehensive look at all new practices and technologies presented in the coffee value chain, along with major private sector and market linkage work accomplished during the year.

Table 1: Y2 On-Farm/Off-Farm Innovations, Market Linkage and Benefits, At a Glance

Technology/Practice or Market Building Activity (coffee – Y2)	Targeted Beneficiaries	Expected Benefits
Production and Processing Practices (coffee – Y2)		
Plantation establishment and management TOT and farmer trainings	Smallholders	Improved plant health; decreased loss to disease; improved yields; better cherry quality; plantations established according to better standards
Composting/coffee plant health ¹² trainings	Smallholders	Improved plant health; decreased loss to disease; improved yields; better cherry quality
Drying tables TOT and community trainings	Smallholders, processors	Improved post-harvest processing, decreased loss to mildew/fermentation; improved quality for increased profitability
Sundried natural processing trainings	Smallholders, processors	Improved post-harvest processing; improved quality to attract quality premiums
Improved storage systems (Pioneer bags + moisture meters + weekly monitoring) demonstrations	Producers, processors, traders	Decreased losses due to poor or inadequate storage processes to increase profitability
Market Building or Private Sector Engagement/Investment (coffee – Y2)		
Estates (large) management assessment and recommendations	Lead firm (large estate) producers/processors	Improved efficiency/productivity through GAP at commercial estates that can filter to smaller-scale growers
Wet processing plant systems analysis at MCG	Lead firm/buyer/exporter	Improved efficiency and increased profitability of lead processing firm/buyer/exporter
Private sector investment and equipment upgrades	Domestic retail, social enterprise, processor	Lilypad invested in equipment and facilities upgrades to expand coffee production; Ban Chuan invested in milling and equipment; Easy Cafes invested in roasting equipment; MCG received a new cupping lab, water recirculation pump and dry mill machinery through Innovative Grant
International buyers’ tour in Burma	Smallholders, processors, lead firms, exporters	Increased visibility of Burma specialty coffee and establishment of new direct trade linkages between global importers and Burma producers/processors

¹¹ The Pre-Q course is informal and conveys no formal certification; it is designed to be preliminary to the full Q Course, presenting subjects and skills in an abbreviated format. The full Q Grader course is intended to lead to Q Grader certification.

¹² This activity started in Q4 of Y1 and ended in Q1 of Y2.

Access to finance/credit facilitated via MCG, Ban Chuan, Su Su Aung	Smallholders, processors, lead firms	Increased investment in the value chain by local financial stakeholders; linking creditors directly to producers to raise working capital and facilitate increased sales
2016 Cupping Competition and Awards Ceremony	Smallholders, lead farmers and firms, processors	Increased visibility and promotion of specialty grade Arabica from Burma; led directly to export purchases
Export process/systems analysis and recommendations	Lead firm/trader/exporter	Improved capacity of lead firms/potential exporters to meet stringent financial and shipping requirements to facilitate increased export volume (to Asia/Europe/North America markets)
Global promotion of Burma coffee at trade events (Seattle, Atlanta, Tokyo, Seoul, Washington, D.C.)	Smallholders, estate farmers, exporters, importers	Increased visibility/awareness of Burma specialty coffee in high-value regional and other export markets aimed at increased sales and profitability for producers
Facilitation of export of 10 MT of Arabica from six smallholder coffee producing communities and 26 MT of estate coffee to North America	Smallholders, processors, estate farmers	Established new direct-market linkages with lucrative North American import market; increased profitability of producers through quality premiums
Pre Q courses	Processors, café owners, lead firms	Enhanced ability to assess and market high-quality coffee to enter more profitable markets
Domestic promotion and marketing of Burma Arabica at Burma events (Brewing/Barista Show in POL)	Producers, roasters, retailers, lead firms	Domestic market strengthening and linkage; increased visibility for high-quality Burma Arabica

THE SOYBEAN VALUE CHAIN

STRATEGY:

VC-RD's strategy in the soybean value chain is to support the growth of an inclusive soybean industry in Burma that meets the quantity and quality requirements of the domestic food-based end-market.

INTERMEDIATE RESULT 1: AGRICULTURAL PRODUCTIVITY IMPROVED

In Y2, to tackle major soybean production and post-harvest constraints, VC-RD presented seven improved technologies including flat-bed dryers, airtight storage bags, hand seeders, Rhizobium inoculant and locally adapted soybean varieties **to a total of 6,070 soy producers¹³ using a variety of innovative extension approaches**, including the following:

- LFAs trained by VC-RD conducted **39** dry season FFDs on irrigated demonstration plots established by the project earlier in the year;
- Lead soybean farmers under LFA and VC-RD oversight conducted **81** FFD follow-up information gathering and assessment sessions with soy producers to gauge the effectiveness of the FFDs in **81** villages;
- LFAs conducted **33** additional, monsoon season FFDs near the end of the rains on nine rain-fed demonstration plots;
- VC-RD's program team worked with lead firms to conduct four flat-bed grain dryer introductory sessions, one dryer upgrading activity and four dryer demonstration and training sessions¹⁴ where the dryers were installed and used.

Southern Shan soybean producers began adopting and using some of these technologies in Y2 immediately after they were introduced. For example, 23 farmers purchased new hand seeders – now available in local stores as a result of VC-RD

¹³ These sessions were conducted in Lawksawk, Kyauktalone Gyi, Loilen (Mong Pone), Laihka, Mong Nai, Namsang, Pindaya.

demonstrations – with about **250 more farmers renting or borrowing hand seeders and using them in their fields in both the irrigated and monsoon seasons**. In all, three different types/brands of mechanized hand seeders are now being imported into the region and are locally available in Southern Shan, while 150 hand seeders are in stock with local vendors for further distribution and sales.

With project support, farmers or brokers were able to dry a total of 106 MT of soybean and maize following the introduction and demonstration of new flat-bed dryer technology. About 60 MT of this dried soybean were sold to tofu processors in Lashio and Yangon at a price 25 percent higher than if they hadn't been dried. After observing operational grain dryers in Lawksawk and Mong Pone, **three private sector companies purchased similar flat-bed grain dryers** indicating strong demand for this new technology that can help both smallholders and processors earn better prices for higher quality grain.

Major On-Farm Activities to Strengthen the Soy Value Chain in Y2

Transferring Technologies to Increase Soy Quantity and Quality

One of the biggest constraints facing soybean farmers in both the monsoon and dry seasons is the dearth of labor during sowing, irrigation (during the dry season), harvest and weeding periods. Family labor may be engaged in other work at these times, while hired labor is increasingly hard to find, with costs rising steadily¹⁵.

The introduction of mechanized hand seeders is helping to address this problem. These seeders require only **one-third the amount of time required** to sow the same area of land by hand, and proved in demonstration trials to be the best method for ensuring proper uniformity and consistent seed depth. Hand seeders are conducive to faster plant emergence and make it easier for farmers to weed their plots, saving time and labor in both the medium- and long term.

Another major constraint is lack of knowledge of effective fertilization practices. Smallholders do not have access to soil testing equipment or services, and typically do not add fertilizer to their soy plants. **VC-RD introduced a low-cost solution in Y2** involving the use of Rhizobium, a micro-organism which absorbs nitrogen from the air and makes it available to soybean roots through symbiosis. Farmers were encouraged by the results of Rhizobium inoculant demonstrated at FFDs in both growing seasons, resulting in new orders for a total of 1,118 packs of Rhizobium, or enough to inoculate soybean sown across 140 hectares (ha), as of the end of the fiscal year.

Introducing new soybean varieties provides farmers with an improved range of choices given varying topography and farming systems. Each soybean growing area's topography (altitude and orientation) determines the temperature of soil during the dry season and therefore the ideal date of sowing. If the soil is too cold, seed will take longer to germinate, germination rates may be sub-par and the entire cycle will be elongated.

One important lesson learned by the project during the Y2 dry season is that different irrigation management practices and varying farmer control of/access to water have a determining impact on differences in yields from farm to farm. In Y3,



Above: hand seeders introduced by the project in 2016 are now available in Southern Shan through local suppliers and used increasingly by soy farmers. They are easy to use and can be easily repaired with locally available parts.

¹⁵ While the cost of one man-day (MD) of labor was only \$2.30/MD two years ago, it is now common for farmers to pay up to \$3.85/MD.

VC-RD will add training on optimal irrigation practices to the toolkit presented to farmers in the areas where erratic irrigation is retarding yields.

INTERMEDIATE RESULT 2: MARKET ACCESS AND TRADE INCREASED

Major Off-Farm Activities to Strengthen the Soy Value Chain in Y2

Reducing Harvest and Post-Harvest Losses

Upland soybean farmers say the main reason some farmers are turning away from soybean (and opting for maize, instead) is that soybean “can’t wait” to be harvested once its pods are ripe, while maize can. When rains abate, farmers typically rush to harvest their soybean. In certain areas such as Lawksawk and Pindaya, they pile harvested, unthreshed plants in heaps and cover them with tarpaulins to protect them from the rain. The grains do not dry properly when stored this way because mold quickly develops, greatly reducing quality. In other areas such as Loilen (Mong Pone), plants are stacked in small bunches and placed upside down in the field. The rain slides along the outer part of the soybean bunches without affecting the inner part. As a result, grain from these areas is slightly less moldy.

Introducing and demonstrating improved drying technology



Above: Gary Alex of USAID's F2F Program inspects a flat-bed grain dryer used by soy farmers in Shan. The dryers have helped increase profitability for smallholders by enabling them to sell higher quality soybean to traders. The project purchased four dryers in 2016 through cost sharing with local lead firms; since then, three additional dryers have been purchased by private sector firms in the region.

In Y2, to tackle the problem of high moisture content of soybean grain, the project introduced flat-bed drying technology, purchasing four large grain **dryers through cost-sharing partnerships with lead soybean processors** in Southern Shan via the project's Innovative Grants mechanism. The project established the dryers, as well as moisture meters, at central locations in Lawksawk, Kyauktalone Gyi, Loilen (Mong Pone) and Laihka, to evaluate the profitability of grain drying as a business and determine whether farmers can obtain higher prices for better-dried soybean grain.

In the monsoon season test run, the four dryers ran for a combined 79 days, with the Lawksawk, Loilen and Kyauktalone Gyi dryers each used from 22 to 25 days -- first to dry soybean harvested during the dry season, and later, to dry monsoon season (upland) soybean and then maize¹⁶. The cost of running a dryer includes labor, gasoline to run the engine (which operates the fan), and rice husks or wood fuel (to create heat). The higher the moisture content of the grain, the

longer it takes to dry, and thus, the higher the operating costs. Profitability of the four pilot grain drying enterprises varied according to operating costs. Owners of the dryers took in a combined profit of \$1,000, **with per ton profits varying from \$6 to more than \$14**¹⁷.

¹⁶ The Laihka dryer was used only for a total of nine days at the end of the rainy season, for both soybean and maize, because no crops are grown there during the dry season.

¹⁷ In Lawksawk where soybean had average moisture content of 27 percent, grain took an average of seven hours/day to dry, and costs were highest -- up to \$14/MT. In Laihka and Mong Pone, where grain dried to a moisture content of 17 percent on average, costs varied from \$6/MT to \$9/MT. In Kyauktalone Gyi, costs were lower because the husks (for fuel) were provided by farmers and family

Introducing and demonstrating improved storage technology

In storage, the final moisture content of soybean grain depends on the temperature and relative humidity of the air around the grain. When placed in an environment that has higher moisture content than the grain, it rapidly absorbs moisture until it reaches an equilibrium percentage. There is no point in attempting to dry/store soybean if moisture reabsorption cannot be prevented.

To help increase profitability in the soy value chain trials compared different storage technologies in strategic locations with the goal of enabling as many soy farmers as possible to observe them. Ultimately, the trials proved that an airtight system -- using bags provided by local supplier Pioneer AgroBiz -- enabled stored soybean seed to maintain the low moisture reached after it was dried. The trials also showed that **absence of oxygen in airtight bags killed weevils and their eggs**, thus restricting damage commonly caused by these pests during the storage phase. Just as important, germination rates of seed stored in these bags remained good, while germination of seed stored using traditional methods (in non-airtight bags) was significantly reduced. Moreover, out of 1,508 farmers who received an airtight bag during the FFDs, over half enthusiastically agreed to test the technology individually, on their own farms. Results of these individual trials will be assessed and reported in Y3.

Facilitating private sector investment in the soybean value chain

Early in Y2, VC-RD organized two workshops in Southern Shan to bring together all Southern Shan soybean value chain stakeholders. The meeting aimed to initiate discussions and build new relationships between soybean farmers and traders, and spark collaboration to set and achieve higher standards to penetrate more profitable markets.

As a result of these vertical linkages, the owner of Yangon Nike Bean Products Factory asked to see the grain dryers in action and to inspect the quality of soy produced. Impressed by what she saw, Nike's owner decided to contract soybean producers in Shan, including VC-RD-supported farmers in Lawksawk, and **is now purchasing improved quality grain from 750 soybean farmers in the region.**

In all, Shan farmers in Y2 received orders for approximately 1,500 MT of soybean per year to Nike, earning premium prices 12 to 15 percent higher than previously. Nike also finalized a deal to supply tofu to City Mart after meeting the company's representative at the VC-RD workshop, and invested funds for improvements, including in food safety, packaging modifications and factory upgrades to diversify the company's product line. **In all, infrastructure investments/improvements made by tofu factory owners following engagement by VC-RD in Y2 totaled \$240,900.**

In addition to private sector linkages reported previously, the following developments are notable:

- The project established a relationship with Jaguco Co., which will open a new soybean extrusion factory that uses a pressure system in Mandalay around the end of 2016. This factory's expected soybean demand is estimated at about 500 MT/month, **a significant potential new market for Shan soybean producers.**
- VC-RD facilitated a pair of soybean conferences conducted by the World Initiative for Soy in Human Health and Texas A&M University, including presentations by an expert to promote extrusion technology. More than 140 people attended these two events, most of whom are oilseed processors who could benefit from adoption of this new technology and its competitive advantages. As a result of these events, three new investors expressed serious

labor used. In Kyauktalone Gyi, when farmers also provided rice husks, drying costs were set at \$10/MT (or at \$20/MT if husks were not provided), while for the other dryers, drying costs were set at \$20/MT.

interest in acquiring the extrusion technology, indicating great potential to further expand the oil-product end-market for Shan soybean farmers.

- In response to interest in new extrusion technology, VC-RD began working with Insta-Pro International, a US-based innovator in chemical-free agricultural processing systems, including oil extruders, to **develop a new payment/credit mechanism to encourage investment in this machinery by Burma oil millers**. A workshop is planned for December 2016 (in Y3) to explore financing for lead firms interested in acquiring the system.
- The project convened a series of two-day trainings aimed at lead/processing firms in the soy value chain (and other VC-RD value chains) covering topics including international food safety standards, factory construction and layout and internal auditing. Implemented in partnership with Control Union, these trainings represent a starting point for companies to begin the Hazard Analysis and Critical Control Point (HACCP) certification process of their respective companies¹⁸. Certification is key to enabling businesses to expand into new, global markets and meet increasingly rigorous food safety requirements.
- VC-RD helped link producers to soybean farmers to end-market businesses including a pair of soy milk producers, SoyAi and Snowball, as well as Myanmar Belle Co. and FedWell Foods, a global social enterprise that produces dehydrated meals to feed the poor. For example, VC-RD linked Snowball to Shan soy farmers who are now under contract to produce several tons of soy per week to meet Snowball's needs.

Table 2: Y2 On-farm/off-farm innovations and market linkages in the soybean value chain, at a glance

Technology/Practice or Market Building Activity (soy – Y2)	Targeted Beneficiaries	Expected Benefits
Production and Processing Practices (soy – Y2)		
New seed varieties (Yezin 14, Yezin 12, Yezin 11, Yezin 8 and Yezin 6)	Smallholders, seed producers, traders	Provided farmers improved/increased variety choices with varying maturation cycles, spreading risk and potentially increasing yields
Rhizobium inoculant	Smallholders, seed producers, retailers	Provided sustainable and less expensive input as alternative to chemical fertilizer; saved money for farmers; improved growth rates, profitability
Mechanized hand seeder	Smallholders, seed producers, retailers	Faster emergence, more uniform maturity and ease of weeding; saved time/labor; increased productivity and profitability
Flat-bed grain dryer procurement, installation and demonstration	Smallholders, seed producers, inputs and equipment suppliers	Supported seed production industry by offering equipment fueled by farm wastes (rice husks); cleaner/cheaper, smoke-free, drying; more farmer bargaining power at farm gate, enabling prices 15-20 percent higher than currently obtainable
Seed storage trials – demonstration of airtight storage bags	Seed producers, traders, retailers	Reduced moisture and reduced pest infestation enabling higher-quality seed product, better prices for seed
Improved seed storage systems and hardware (bags)	Seed producers, traders, retailers	Increased availability of improved seed varieties; stimulated new seed production sector; increase volume of sales and profitability

¹⁸ The project will collaborate with the United Nations Industrial Development Organization (UNIDO) in Y3 to help facilitate factory certification by supporting factory pre-audits of sites and requirements to obtain HACCP certification. UNIDO will provide technical team and laboratory testing of products for food safety compliance.

Personal Protective Equipment for safe use of inputs (cap, goggles, long-sleeve clothing, masks, gloves and boots)	Smallholders	Raised awareness on the importance of safe use and handling of pesticides and the importance of protecting oneself when spraying chemicals
Market Building or Private Sector Engagement/Investment (soy - Y2)		
Sales of improved, dried seed	Smallholders, lead firms, traders	Increased smallholder and processor profitability through sales of improved seed
Tofu Stakeholders' Workshop - market linkage activity	Smallholders, processors, retailers, lead firms, seed producers	Upgraded tofu factory production with new technology to increase productivity and quality
Investment by private sector tofu factories in equipment upgrades	Processors/retailers primarily; smallholders through increased demand	Increased investment in equipment/systems upgrades to streamline processes and improve tofu quality
Private sector purchase of improved grain from VC-RD supported soy growers	Smallholders, seed producers, tofu processor, retailer	Linkages facilitated between Shan producers and Rangoon and Mandalay-based tofu processors creating business opportunities and increased sales
Rhizobium inoculant sales	Inputs suppliers, smallholders	Boost for farm productivity and saved farmers money compared to use of chemicals
Sales/purchases of hand-seeder	Inputs suppliers, smallholders	Stimulated sales of improved technology to reduce labor and improve efficiency
Private sector purchases of three new, flat-bed grain dryers	Processors, smallholders	Enabled expansion of market for improved quality (better dried) grain and improved access to new technology

The Ginger Value Chain

STRATEGY:

The project's strategy in the ginger value chain is to support an inclusive ginger industry that meets the increased quantity and quality requirements of both domestic and international end-markets (especially the organic export market).

INTERMEDIATE RESULT 1: AGRICULTURAL PRODUCTIVITY IMPROVED

Approximately 10,000 smallholder farming households sow a total of around 2,400 ha of ginger in six townships of Southern Shan, producing a total of about 30,000 MT of fresh ginger yearly. This amount constitutes approximately 90 percent of Burma's entire fresh ginger production. Average yields are relatively high compared to global averages, at about 12 MT/ha; average plot size is approximately 0.2 ha to 0.3 ha. Over the life of the project (LOP), VC-RD aims to directly benefit at least 3,000 ginger growing households, or about one third of Burma's ginger production universe.

In Y2, as a result of VC-RD assessments¹⁹, VC-RD expanded its support to smallholder ginger value chain, which started on a small scale in Y2 Q1 through partner MIID. On the production side, the project focused on introducing practices and technologies designed to maintain soil productivity and help maintain relatively high ginger yields through environmentally

¹⁹ Assessments evaluated potential profitability of ginger, market potential, barriers to entry and potential to scale up farmers' participation

sensitive practices (presented at demonstration plots) including contour planting, mulching, natural composting and intercropping. On the market side, the project's goals include:

- To assist private sector buyers of organic ginger to improve business profitability by expanding organic ginger exports to Europe and the U.S.;
- Work with certification auditors (such as Control Union) to assist organic ginger processors to comply with international quality standards, HACCP and other certifications in order to sell organic ginger to high-end regional and international markets;
- Assist ginger processors to upgrade equipment to become more efficient and competitive internationally; and
- Assist processors to identify new contract farming opportunities for organic ginger in Shan State.

Major On-Farm Activities to Strengthen the Ginger Value Chain in Y2

In Y2, VC-RD provided training to **1,347 ginger farmers** and value chain stakeholders on good agricultural techniques and concepts including compost production and use, soil conservation, and safe handling and use of pesticides. These trainings were carried out through four major activities:

- 20 compost making and soil conservation training sessions carried out in 19 villages in the Taung Kwe Village tract;
- Three FFDs delivered on three ginger demonstration plots to introduce five improved agricultural practices;
- Three trainings on safe use and handling of pesticides led by a volunteer expert;²⁰ and
- Trainings through MIID in six villages in Lanmagkwe (near Heho) focusing on water and soil management strategies; methods for selecting good seed; pesticides and fungicides with low toxicity; drip irrigation schemes; cover crops/green manures; composting with Effective Micro-organisms (EM); proper safety protocols for chemical pesticide use; marketing and basic book-keeping; and seed banking principles and practices.

Composting with natural materials and improved soil conservation

In March 2016, shortly before most ginger farmers began sowing, VC-RD conducted 20 trainings in 19 villages **on how to make bokashi fertilizer²¹ and soil conservation techniques. In all, 380 farmers (38 percent women) attended** these trainings. Before the training, only three percent of participants knew about the benefits of composting with cow dung and the necessity to better protect and conserve soil, especially on the steeply sloping plots where most ginger is sown in this region.

After the training, **more than 96 percent of participants said they understood and could apply practices** taught, by making one of two types of bokashi -- using either EM or chicken manure. The same high percentage of participants were able to practice different methods of **protecting top soil on sloping land** -- including using leguminous cover crops, planting along contour lines and replanting local tree species to prevent erosion and loss of topsoil²².

²⁰ These trainings, led by a VC-RD volunteer, were held in Taunggyi, Pindaya and Aung Ban involving agriculture input retailers, CBOs and farmers. The activity was reported in the Q3 Progress Report.

²¹ Bokashi is a Japanese composting technique that uses indigenous micro-organisms collected from the environment surrounding the farm to turn discarded plant waste into nutrient rich fertilizer. Bokashi can help to restore the microbial community in degraded agro-ecosystems and improve crop productivity.

²² Adoption rates will not be known until Y3, because the ginger cropping cycle is very long and most farmers presented with new practices in Y2 will begin applying them next year.

Establishing demonstration plots and conducting ginger FFDs

Later in March 2016, the project set up three demonstration plots²³ to demonstrate the use of chemical-free cultivation practices, which could present attractive solutions to common constraints faced by ginger farmers, including topsoil erosion, shorter fallow periods and decreased soil fertility, rhizome rot and decreasing yields, weed competition and lack of knowledge on proper use of inputs including herbicides.

The project explored five cultivation practices that can be substituted for, or complement current practices:

- *Trichoderma*²⁴ soil application;
- Mulching;
- Soaking tubers in EM solution;
- Intercropping of ginger with pigeon pea; and
- Bokashi application as a substitute for current fertilizers.

Results of the demonstration plots on yield were not available at the time of this report and will be presented in Y3 VC-RD progress reports after the ginger harvest cycle is completed.



During ginger FFDs, one farmer, U Ba Lune, remarked that “his group sees (that) EM and bokashi treatments are good. Soaking ginger in EM solution followed with EM5 solution spraying is the best for all treatment(s).” U Ba Lune sowed 3,260 kg of ginger on 1.2 ha this year. Half the amount was sown with bokashi application and spraying EM5, but without soaking ginger seed rhizome in EM solution. So far, no diseases have infected his plants, which are healthy looking and dark-green in color, according to his presentation.

Major Off-Farm Activities to Strengthen the Ginger Value Chain in Y2

Most off-farm activities (private sector linkages and market expansion) in support of the ginger value chain will begin in Y3. VC-RD plans to award an Innovative Grant to a major processor²⁵ of organic and conventional ginger for factory equipment upgrades and technical assistance at its ginger processing plant; the solicitation was under review as of the end of Y2. The company has great potential to increase their export load, thus providing a new market for Burma ginger producers, **with estimated export capacity for 2017 valued at \$4,000,000.**

In addition, the project continued to engage another lead ginger processing company, SPSH & Associates, which produces organic ginger oil. This company participated in HACCP courses conducted by the project in collaboration with Control Union during Y2, and its management is interested in obtaining certification and working with the project to expand market opportunities both in the European Union and U.S.

Also in Y2, the project provided ginger market information to Sun Impex, an export firm based in Rangoon that is exploring raw organic ginger production sourced from Shan. This company is interested in establishing a production facility for value-added ginger products such as ginger syrup and preserved ginger in Burma, and collaborating with VC-RD as a lead firm. Outcomes of these private sector linkages in the ginger value chain will be reported in Y3.

²³ These plots are located in Na Boh Kone, Pa Hta Ma and Ga Naing Yar.

²⁴ *Trichoderma* is a bio-control agent against fungal diseases; it grows on root surfaces and is effective against root diseases in particular.

²⁵ Myanmar Agri Business Group.

Table 3: Y2 Innovations in the ginger value chain, at a glance²⁶

Production Technology/Practice (ginger – Y2)	Targeted Beneficiaries	Expected Benefits
Soil conservation and production of bokashi compost	Smallholders	Improved/maintained soil fertility; prevent erosion; improved/maintained high yields
<i>Trichoderma harzianum</i>	Smallholders	Protected ginger plants against rot infestation
Mulching with rice stem husks	Smallholders	Increased yields; increased emergence speed; decreased rate of disease
EM solution - demonstration	Smallholders	Decreased risk of plant infections/disease; increased moisture retention, potentially improving yields, productivity and profitability
Bokashi composting	Smallholders	Increased moisture retention in soil/increase emergence speed; reduced root rot and infection incidence
Contour planting	Smallholders	Protected land from erosion of the top soil; prevented land erosion
Intercropping with pigeon peas	Smallholders	Increased soil moisture retention/increase emergence speed; reduced root rot and infection incidence; improved/maintained soil health; encouraged crop diversity
Training on safe/responsible use of agriculture inputs (pesticides)	Smallholders, input suppliers, consumers	Increased protection of human health and the environment; more efficient and money-saving input practices

The Sesame Value Chain

STRATEGY:

The project's strategy in the sesame value chain is two-fold. First, the project will support improved productivity and quality of raw sesame with the goal of increasing the quantity and price of sesame consumed domestically or exported. Secondly, VC-RD will work with private sector firms to explore diverse, high-quality export markets.

INTERMEDIATE RESULT 1: AGRICULTURAL PRODUCTIVITY IMPROVED

Sesame is the most important oil seed in Burma, with sources at Yezin Agriculture University citing 2014 production at more than 850,000 MT from more than 1.5 million ha in the Dry Zone. Yet sesame farmers are in dire need of GAP training and extension services to improve quality, maximize productivity and yields to penetrate new domestic and global markets. Identification and use of high-quality seed, correct crop establishment and plant density, improved weed control and appropriate fertilization practices are all required improvements in sesame agronomy. Lack of knowledge and technology to perform effective post-harvest handling also is a critical constraint²⁷.

²⁶ Major off-farm, market linkage and private sector investment/engagement work in the ginger value chain is expected to begin in FY 2017 and will be covered in subsequent progress reports.

²⁷ For example, standard practice on most smallholder sesame farms at present is to stack and dry harvested sesame in the field for five days. This should be reduced to two days and harvested plants should consistently be covered if it rains, reducing loss from shattering and better controlling moisture.

Major On-Farm Activities to Strengthen the Sesame Value Chain in Y2

In Q2 of FY 2016, VC-RD began collaborating with sub-grantee SARA through an Innovative Grant to implement sesame farmer training programs using accepted GAP training methodologies. Problems identified during early assessment include:

- Improper plant establishment leading to reductions in plant populations of up to 50 percent;
- No soil test analysis performed to determine fertilizer requirements or pH levels;
- Lack of weed control, resulting in yield losses of 20 to 30 percent;
- Incorrect and erratic use of pesticides and fungicides; and
- Improper post-harvest systems resulting in losses from too much moisture, rancidity and foreign matter.

To address these constraints, VC-RD and SARA through the “Unlocking Sesame’s Potential for Export in Magway” program **trained 989 sesame farmers²⁸ in 45 villages** in Magway, Natmawk and Taungdwingyi townships during Y2. To reach this many farmers, SARA first conducted TOT to 120 lead farmers across these villages, covering the following topics during a series of FFS events:

- Crop establishment, including field selection, plant population and spacing;
- Plant nutrition, including soil testing techniques, appropriate fertilizer types and application methods including rates and timing;
- Pest and disease management, including crop scouting, pest/disease identification and control methods; and
- Post-harvest practices, including field cooling, packing and grading, transport and packaging.

Lead farmers then trained other sesame farmers in a series of 50 training sessions held in 33 villages, covering these and other topics, including alternative plant nutrition using animal manure as fertilizer and proper/safe use of chemical, biological and mechanical methods for controlling pests and diseases. In addition, SARA **established four sesame field trials near four FFS sites to demonstrate these practices.**



Above: Dry Zone sesame farmers during the harvest season in 2016.

Representatives from Pioneer Agrobiz attended some of these demonstration activities to present the use of improved technology including a hand seeder; how to dry sesame seeds with a mechanical dryer; how to measure moisture content of sesame by using a moisture meters; and how to store sesame using hermetically sealed storage systems, such as the Pioneer airtight bag combined with a mobile granary. **SARA and Pioneer also distributed a total of 354 airtight bags through lead farmers for demonstration and use in future trainings.**

The FFS and demonstration plot activities enabled farmers to examine and compare, first-hand, the performance of sesame planted under conventional methods (with chemical inputs) to plants cultivated non-chemically, using “GAP” and organic methods for fertilization such as

²⁸ Including 218 women.

fish amino acid and *Trichoderma*, as well as use of neem oil for pest management. Sesame farmers also learned how to make biochar²⁹ with rice husks and ground nut husks, and how to measure soil conditions such as nitrogen and phosphate content with soil test kits.

Many farmers who attended demo plot and FFS sessions in August 2016 said they were impressed by the performance of plants cultivated naturally. They **expressed interest in learning more about chemical-free production and Integrated Pest Management (IPM) as they consider whether organic cultivation is a new path to increased profitability**. Regardless of whether farmers opt for the organic route, improved production and processing practices will help sesame farmers meet tougher export quality standards, enabling them to tap new markets, boost incomes, and contribute to economic development.

A proposed expansion of the SARA project through an extended partnership with VC-RD through 2019 was in development as of the end of Y2. If approved, the number of sesame farmers targeted for support would expand to a total of 9,000 farmers (from the currently targeted 3,100) by the VC-RD project's end.

INTERMEDIATE RESULT 2: MARKET ACCESS AND TRADE INCREASED

Major Off-Farm Activities to Strengthen the Sesame Value Chain in Y2

In Y2, VC-RD and SARA developed relationships with two national agribusiness equipment supply firms (Pioneer and Good Brothers Co.) to discuss opportunities for potential collaboration as lead firms, with the goal of connecting the companies to sesame producers and processors. As a result, Pioneer demonstrated use of selected post-harvest technologies to 63 sesame lead farmers, including presentations on sesame drying using a mobile (field) drying system and, as noted above, demonstrations of the benefits of using airtight bags for improved storage. **Pioneer also contributed one hand seeder to SARA for use on sesame demo plots**, to illustrate to farmers the benefits of planting sesame in evenly spaced rows, and carefully maintaining recommended seeding rates per hectare.

Also in Y2, VC-RD supported sesame processors by sending samples for display at the MFVP-sponsored booth at the South East Asian Agri Business Trade Show (SIMA) in Bangkok. As a result of this trade fair, a Taiwanese trading company is now interested in sourcing/purchasing sesame from Burma for export. (VC-RD then connected the company directly to a supplier in Magway to review requirements.) Participation in regional trade events is one example of how VC-RD can help expose Burma sesame to new/alternative markets internationally, facilitating potential deals and stirring increased demand that can result in improved livelihoods for producers and processors.

Finally, in Y2 VC-RD and SARA began collaborating with OAL to pilot an organic sesame contract farming concept. Currently, OAL, in conjunction with Tradin Organic, are contracted to 25 growers in Nimbu Township to grow organic sesame under Control Union guidelines for export grade product. VC-RD in Y3 will continue working with both companies to develop transparent contracts between farmers of organic sesame and OAL, **with the goal of ensuring that certification benefits accrue to growers**. VC-RD hopes to continue its support to organic sesame growers by assisting in training OAL extension agents on organic sesame farming systems in Y3.

²⁹ Biochar is a natural soil amendment comprising burned agricultural waste/debris.

Table 4: Y2 On-farm/Off-farm innovations in the sesame value chain, at a glance³⁰

Technology/Practice or Market Building Activity (sesame – Y2)	Targeted Beneficiaries	Expected Benefits
Production or Processing Improvement Activity or Practice (sesame – Y2)		
Crop establishment, soil fertility, IPM, post-harvest management	Smallholders	Increased yield and improved quality of sesame to enable higher incomes at production level
TOT for LFAs (same topics as above)	Lead farmers	Improved and strengthened extension services provided to small holder farmers
Farmer Field Schools established	Smallholders	Improved and strengthened extension services provided to small holder farmers
Improved storage systems and drying with Pioneer bags	Smallholders	Improved post-harvest practice to reduce loss of seed quality
Farm demonstration plots established	Smallholders	Live demonstrations of improved technology and “GAP”
Market Building or Private Sector Engagement/Investment (sesame – Y2)		
Participate in South East Asian Agri Business Trade Show in Bangkok (with MFVP)	Smallholders, processors	Global market linkage opportunities for smallholders
Collaborate with OAL and Tradin to design contract farming scheme	Smallholders, lead firms	Development of new organic market route for smallholders interested in new, potential high value sesame markets

The Melon Value Chain

STRATEGY:

The project's strategy in the melon value chain is focused on building efficiencies and relationships to strengthen market channels and increase income for melon farmers in the Dry Zone. This means improving production practices to increase sustainability and meet “GAP” criteria, reducing excessive use of pesticides, ensuring appropriate fertilizer applications and establishing sound crop rotation strategies.

INTERMEDIATE RESULT 1: AGRICULTURAL PRODUCTIVITY IMPROVED

In Q2 of FY 2016, VC-RD began supporting the melon value chain through an Innovative Grant award to MFVP, the country's main horticulture trade association. The melon value chain is one of the most important horticulture value chains in Burma, with annual production of nearly 1,000,000 tons³¹ and estimated annual net profits of up to \$1,500/acre. The Innovative Grant Program, “*Upgrading the Melon Value Chain in Myanmar*,” aims to strengthen the melon value chain and support smallholder farmers in the Dry Zone by providing “GAP” training under MFVP's auspices.

³⁰ Most major off-farm, market linkage and private sector investment activities in the sesame value chain are expected to begin in FY 2017 and will be covered in subsequent progress reports.

³¹ Of Burma's total annual melon production, about 65 percent is exported (mostly to China) and 35 percent, mostly from the monsoon season crop, is consumed domestically.

Remarkably, by the close of Y2, **MFVP had exceeded its target of 1,500 melon farmers, reaching a total of 1,859 melon farmers³² with vital agronomic information** on practices including pest and disease management, plant and soil nutrition, and harvest and post-harvest best practices. This achievement is attributed to MFVP's excellent and far-reaching network in horticulture value chains and the high motivation levels and generally high capacity of melon farmers found in the Dry Zone. A planned extension of this program, under review as of the end of Y2, proposes to expand the total number of beneficiaries under the melon value chain to 8,000 farmers by the end of the VC-RD project in 2019.

The melon value chain interventions are designed to improve smallholder farmers' livelihoods by linking growers to new global markets, and to increase sales, in addition to addressing productivity. The program also will help MFVP improve its overall capacity as an organization through association-strengthening activities set to take place in Y3.

Major On-Farm Activities to Strengthen the Melon Value Chain in Y2

During assessments conducted early in Y2 in melon farming areas, VC-RD and MFVP learned that melon farmers are hit with huge losses and high waste rates annually as a result of generally poor production, harvest and post-harvest techniques. For example:

- Few melon growers make use of soil test kits³³ or analysis to determine fertilizer requirements and pH levels, leading to either over- or under-application of fertilizers;
- Melon farmers generally do not routinely test water therefore have no idea of the pH, which is detrimental to pesticide use³⁴;
- Pesticides and fungicides are not used in any organized/rotational manner³⁵;
- Harvesting and transport do not follow best practices, (e.g., growers typically harvest melons in the open where fruit is stacked/exposed to sun, wrapped loosely in paper and stacked in truck in layers 10-12 melons deep); and
- No field grading is undertaken, with melons of all grades included in loads sent on the 12-15-hour journey on poor roads to Muse, a major trading post at the Burma/China border.

In Q3 of FY 2016, MFVP conducted a "GAP" Awareness Training program in 24 villages in Sagaing and Mandalay covering 1,859 melon farmers across seven townships. In all, trainers carried out 30 training sessions³⁶.



A melon farmer uses plastic mulch to start melon seedlings during TOT for lead melon farmers in Sagaing.

³² The program is implemented in four townships in Sagaing: Chaung Oo Township; Butalin Township; Watlat Township; and Myaung Township; and two townships in Mandalay: Tadar U Township and Myit Thar Township.

³³ Soil test kits were not part of the MFVP melons grant/program budget, but most melon farmers have the financial means to test their soils and have begun doing so as a result of MFVP trainings raising awareness of the need to know more about conditions in order to apply correct plant nutrition requirements.

³⁴ The pH of water used in spray tanks influences how effectively many pesticides work; the more alkaline the water, the more rapidly the pesticide breaks down.

³⁵ Because melons are susceptible to many pests and diseases, they require systematic planning for treatment; if farmers do not follow planned rotations in use of these chemicals, resistance can build up over time, or even eventually render the chemicals useless.

³⁶ These sessions were originally intended to be limited to 50 participants per session, but after word spread about them, additional participants interested in GAP for melon farming showed up at many of the events.

Trainers provided a standard set of “GAP” guidelines that included explanations of international standards and regulations addressing environmental, economic and social sustainability practices for on-farm processes, as well as improved food safety and quality standards of food and other agricultural products. These **trainings helped melon farmers better understand both national and international requirements for pesticide use**, as well as maximum levels of permitted contaminants in food and non-food products.

Building on the base of knowledge transferred through the “GAP” trainings, in September 2016, VC-RD arranged for a volunteer agronomist and IPM expert to conduct TOT to 30 selected MFVP lead farmers from 31 villages in Sagaing. The TOT helped reinforce and drill deeper into topics covered in the first round of “GAP” trainings, generally covering pest and disease management, plant nutrition and post-harvest management.

The volunteer assignment ended early in October 2016 and will be reported upon in the FY2017 Q1 Progress Report.

INTERMEDIATE RESULT 2: MARKET ACCESS AND TRADE INCREASED

Major Off-Farm Activities to Strengthen the Melon Value Chain in Y2

VC-RD support to the melon value chain in partnership with MFVP started in Q2 of FY 2016 and focused mostly on the production end. The project supported four significant, off-farm activities in Y2 that helped melon value chain stakeholders begin to address a range of thorny problems that limit profitability of melon farmers, including: 1) the huge issue of certification and testing of melons seeds; 2) the desperate need for transformation in the border trading system that currently puts melon farmers at an untenable disadvantage; and 3) the urgent need to penetrate new regional and international markets outside China.

Solutions to improve access to better melon seed

Currently, most melon seed used in Burma is supplied by agents working at the Muse Border, near China. These agents receive seed from Chinese buyers but have no idea whether the seed is actually viable, fresh or certified. Growers often find that when their seed begins producing, young melons are of varying colors and sizes, rendering the crop virtually worthless and resulting in huge losses.

The regional Minister of Agriculture, Livestock and Irrigation told participants at the Seed Forum that the Ministry is embarking on an awareness campaign of the “Myanmar Seed Law” in selected melon-growing townships to educate farmers how to make better choices when procuring seed. On a practical note, MFVP and four private sector seed companies agreed to meet and discuss a bulk-buying arrangement for distributing certified melon seed through the association to melon farmers.

To begin dialogue to find solutions, VC-RD and MFVP coordinated an event that brought together 600 smallholder melon farmers³⁷ at the nation’s first “National Melon Seed Forum.” The forum **addressed important issues including the impact of importation of uncertified seeds** and Burma government testing requirements and standards. The event led to creation of a new 15-member Melon Seed Working Group tasked with following up on specific issues/goals raised at the forum, including:

- Ensuring that seed pack labels imported from China are translated into English and Burmese³⁸;

³⁷ A total of 757 people attended this event in June 2016, 600 of whom identified themselves as melon farmers. Other stakeholders included input suppliers, melon cluster representatives, traders, private sector seed companies, the regional Minister of Agriculture, Livestock and Irrigation from Mandalay and the Director of the Ministry of Commerce.

³⁸ Translation into English is already happening (as of August 2016); a system for translation into Burmese language is in progress.

- Continuing/expanding private sector melon seed trials³⁹ in Burma with the goal of registering and commercializing additional melon varieties acceptable to Chinese buyers; and
- Completion of a cost-benefits analysis by East-West Seed Co. following the results of local watermelon breeding programs; expanded distribution of the approved “Shwe Ya Thar” to disseminate a total of 7,000 seed packages this year.

The Melon Seed Forum was an important first step in getting the melon value chain actors to work together to help advance work on these goals and solve issues. The new Melon Seed Working Group will **advocate for better control of imports and better testing** before seeds go on the market in the Dry Zone.

Improving melon farmer bargaining power at the Muse border

Building on momentum generated by the Melon Seed Forum, MFVP and VC-RD coordinated a second event in Y2 that opened the door for Burma melon growers to enter discussions with agents/buyers on establishment of a new melon grade and price standards, as well as an independent arbitration body to quickly settle grade and price disputes at the Muse border.

Smallholder melon farmers typically have little or no bargaining power or control over the market, with prices often discounted unpredictably after melons cross the border into China. To develop solutions that benefit smallholder melon growers, the project and MFVP facilitated the first “Melon Growers and Traders Forum,” held at Muse in Northern Shan. Thirty-two melon growers from three different regions and 28 melon traders and commodity exchange representatives attended this event, which resulted in improved relations between traders and growers through open, transparent discussion of market issues affecting both parties.

The Forum also yielded widespread consensus on the need for establishment of the new price and grading standard to help smallholders earn better prices at the border. The agreement is targeted for implementation in February 2017 (Q2 of Y3). The proposed new system would enable melon transactions to be finalized on the Burma side of the border, with ownership of melons transferred from producers to Burma agents, who would then deal with Chinese buyers to work out details for the melons to cross into China.

Expanding markets for Burma melons (CAEXPO and SIMA)

VC-RD and MFVP supported three lead melon producers from Sagaing to attend and display their finest fruit at the 13th China-ASEAN Expo (CAEXPO) agriculture trade fair in Nanning City, China, from Sept. 11-14, 2016. Attendance at this huge annual exposition linked Burma melon growers directly to buyers for supermarket and other retail outlets in China, bypassing the usual melon trade route into China at Muse. The growers who attended this event gained firsthand knowledge of the requirements of regional and international markets with regard to food safety, quality, consistency and supply. After returning, these growers made decisions to change how they grade and transport melons to the market. For example, farmers learned they will need to adhere to specific buyer requirements, such as supplying certain grades (by size and color) of melon, better protect the fruit when transporting (i.e., use plastic crates instead of random stacking), and adhere to a certain degrees Brix (sugar content of the fruit) and acceptable/safe chemical residue levels. Attendance

³⁹ Trials are underway by The Seed Energy Co., a Burma company. So far, one watermelon variety, “Seed Ruby 999,” is commercialized and a second watermelon variety, “824,” is under registration. One muskmelon variety has been commercialized as well.

at the Expo also helped stimulate interest in plans calling for construction of new packing houses in Burma to adhere to international standards and “GAP” requirements.

Additionally, VC-RD sent samples of Burma melons via MFVP to the SIMA trade show (held in September) in Bangkok.

Table 5: Y2 On-farm/Off-Farm innovations in the melon value chain, at a glance⁴⁰

Technology/Practice or Market Building Activity (melon – Y2)	Targeted Beneficiaries	Expected Benefits
Production or Processing Improvement Activity or Practice (melons – Y2)		
Melon production “GAP” principles including crop health/protection, rotation and soil health	Smallholders	Increased yield and improved quality of melon to enable higher incomes for smallholders
TOT on plant nutrition, IPM and post-harvest practices	Lead farmers	Improved extension services
Melon production trainings on plant nutrition, IPM and post-harvest	Smallholders	Improved extension services
Market Linkage and Private Sector Engagement/Investment (melons – Y2)		
MFVP Seed Forum – Mandalay	Input suppliers, smallholders, lead firms	Introduced private sector seed companies to begin to produce hybrid melon seed
MFVP Grower/Trader Forum – Muse Border	Smallholder, agents, buyers,	Improved trading system at Muse Border; improved grade, standard and price system to benefit all stakeholders
MFVP Trade Fair, CAEXPO, SIMA	Smallholders, traders	Improved market penetration, links to potential new customers/contracts

Improving Knowledge about Safe/Responsible Use of Agriculture Inputs (Cross-Cutting)

During assessments carried out in the first quarter of Y2, VC-RD learned that safe/responsible use and handling of pesticides in Southern Shan is now a serious environmental and public health issue. Very few farmers in the region use Personal Protective Equipment, (gloves, boots, masks, goggles or hats); local agro-chemical retail distributors don’t know which pesticides should be used on which crops, on which pests or at what times; instruction labels and safety warnings from imported inputs are not translated into Burmese; farmers don’t know basic information about dilution ratios; and may never have learned that different pesticides have minimum waiting periods before harvest during which no spraying should occur to avoid poisoning consumers.

To bridge the knowledge gulf about safe input use, VC-RD arranged for a pesticides safety and IPM expert from the University of California to conduct a volunteer assignment that included three trainings in Taunggyi, Pindaya and Aung Ban attended by 107 participants, including agro-chemical dealers from nearby townships and villages, as well as farmers. The volunteer emphasized the need for farmers and retailers to better understand labeling and basic pesticide safety guidance, including minimum pre-harvest intervals, minimum safe periods for re-entering fields after spraying, and the need to properly protect skin, eyes and lungs from chemicals by using standard personal protection equipment.

⁴⁰ Most major off-farm, market linkage and private sector investment/engagement work in the melon value chain is expected to begin in FY 2017 and will be covered in subsequent progress reports.

These trainings set the stage for a first-of-its kind public awareness campaign on safe use of pesticides conducted by VC-RD with partner Internews. (Please see the Communications and Outreach Section, below, for more information on the PSA campaign.) The pesticides safety curricula developed and approved by USAID for this assignment will continue to be used in planned pesticide safety trainings in Y3.

KNOWLEDGE MANAGEMENT AND SHARING (CROSS-CUTTING)

COMMUNICATIONS AND OUTREACH

Year 2 saw a substantial increase in the scope of communications, outreach and extension activities conducted in support of value chains work, due to addition of new value chains and more market linkage activities, mostly in the soy and coffee value chains. The project's media partner, Internews, also significantly ramped up work in FY 2016, a result of the project receiving necessary approvals to work with Burmese-owned FM radio stations that enabled it to design and launch a new agriculture and market information radio show in collaboration with its local media partner, AMIA.

In all, VC-RD supported the production and distribution of **22 agriculture information programs aired on Shwe FM** focusing on various agriculture value chains and market trends, as well as issues and extension advice from experienced local farmers discussing different specialty and commodity crops. This show, aired twice weekly, **helped the project reach millions of listeners across seven states**⁴¹, **improving access to agriculture market news and extension information** reported by journalists specializing in agriculture market reporting, and overseen by experienced Internews staff. Digital audio files of the shows are uploaded onto AMIA's Facebook page⁴² for further online dissemination and to ensure ongoing availability, online, for this information.

Also in Y2, AMIA continued to widely distribute its successful weekly agriculture market information report, disseminating agriculture market prices through 10 national and regional print journals and newspapers⁴³; two national television stations (MRTV and SkyNet); one national radio station (MRTV Radio); two agriculture/news websites (Green Way and Mizzima Media); and one mobile application (YBiz). AMIA's success in curating and distributing weekly agriculture price information drew interest in Y2 from a global mobile media developer, which signed an agreement with AMIA to continue providing agriculture market content via a large call-in center, helping to further increase access to agriculture market information.



Above: a reporter for Shwe FM's "Happy Agri" radio show, featuring different agriculture value chains each week, interviews a tomato farmer on Inle Lake for a program that aired in September 2016.

⁴¹ "Happy Agri in the Golden Land" first aired on Shwe FM on Feb. 11, 2016; in mid-July, it increased in frequency from bi-weekly to weekly. Each show consists of a market news bulletin; four news briefs on agri-market and related issues; and a new feature focused on a different agriculture value chain or topic each week. The show steadily gained in popularity in Y2, attracting a private sector advertiser (an inputs company). This broadcast reaches listeners in Ayeyarwaddy, Sagaing, Mandalay, Magway, Mon and Shan.

⁴² <https://www.facebook.com/amiamyanmar/?fref=ts>

⁴³ Newspapers or journals currently carrying the market report include: *Democracy Today*; *The Standard Times*; *The Trade Times*; *Golden Hexagon*; *Advertising World*; *Myanma Alinn*; *7 Day News*; *Agro Techni-Pedia*; *Mandalay Alinn*; and *The Farmer Journal*.

In all, the project, working with Internews, AMIA and the media, facilitated the **production and/or dissemination of more than 100 agriculture information and/or news products in Y2, including extension information on new agriculture practices and technologies, and agriculture market prices** and trends, via nationwide and regional print, television and radio, as well as globally via social and other online media.

VC-RD also supported a wide range of live extension and market linkage events in Y2 that helped promote USAID's topline messages of support for inclusive economic growth and increase domestic and international understanding of USAID's work in support of reform and broad-based economic development.

In Q4, the project provided information about Burma's coffee value chain to a financial news reporter from Reuters, resulting in a story about the first-ever export of certified specialty grade coffee from Burma. The Reuters feature helped promote a high-profile launch of smallholder coffee at La Colombe Café in Washington, D.C., that resulted in a multimedia piece about Burma coffee by Devex.com. The Reuters story was disseminated widely via major financial news outlets including Fortune.com, **putting a global business spotlight on Burma's previously unknown coffee value chain** and creating new market leads and opportunities for local producers.

Also in Q4, a VC-RD volunteer melon agronomist became a social media sensation in Burma after a video about the assignment was posted on the *7 Day Daily* Facebook page. Within a day, the video **had been viewed 49,000 times and shared nearly 800 times**, amplifying information about innovative production techniques including IPM that can help melon farmers reduce reliance on expensive chemical inputs.

VC-RD and Internews also continued to support production of video extension materials throughout the year. These



Above: the first export of specialty smallholder coffee from Burma made a splash at La Colombe, a high-end café in Washington, D.C. in 2016. La Colombe was among the global buyers linked to Shan smallholders as a result of VC-RD work during Y2.

videos carry messages on best production and post-harvest practices for VC-RD supported crops. In Q4, the project documented and edited three new video packages focusing on extension and new technologies introduced in the soybeans, ginger and melons value chains. Production of a "Coffee Drying Table" DVD was also finalized⁴⁴.

These extension products are proving effective extension tools, especially among smallholder farmers who may not have access to satellite TV. More than 2,000 discs have been distributed during interactive field training events, mostly in the soybeans and coffee value chains. So far, 10 USAID-branded video extension/outreach tools have been finalized or are in production, with editing and production oversight by VC-RD.

Burma's first Agriculture Public Service Announcement (PSA) campaign and competition helped engage both the public and media to develop messaging and outreach focused on the theme of safe and responsible use of agriculture inputs. In all, the campaign yielded nine new PSA "pilot" products following a call for submittals for an Agri-PSA Competition submitted by a range of entities.⁴⁵

⁴⁴ These videos were in the final stages of production and editing as of the end of Y2 and will be released in Y3.

⁴⁵ Original PSAs created and submitted for the contest came from Green Way; IDEA; AMIA; Golden Ground Organic Farmer Field School; freelance journalists/designers; and independent smallholder farmers from Southern Shan.

The project honored winners of the contest at an awards ceremony at the MFVP Trade Fair in June 2016, helping to raise community awareness of the need for safe/responsible use of inputs. **One of the pilot PSA videos is now being aired repeatedly on a national TV news station**, indicating that the concept of no-cost “public interest” broadcasting aimed at benefitting farmers and communities is beginning to take hold.⁴⁶ After the video began airing nationally, a representative from the Ministry of Agriculture requested permission from VC-RD to use the PSA as part of the Ministry’s own agriculture extension program, indicating further uptake of this critical extension information.

MONITORING, EVALUATION, AND LEARNING

Tools, Procedures and Human Capacity for Performance Reporting

Early in Y2, VC-RD brought the MEL Reporting System online, enabling the project to maintain structured and easily managed project performance records in compliance with USAID data quality requirements. The MEL team also instituted standardized performance reporting procedures that enabled it to consistently collect, process and disseminate performance data across the project and its partners in line with the VC-RD MEL plan.

Throughout the year, the MEL team trained project team members and partner organizations on the project's reporting requirements, procedures for performance reporting, maintaining data quality and the use of the MEL Online system.

GRANTS MANAGEMENT

A summary of all active Innovative Grants as of the end of September 2016 is included, below:

Grantee: MIID

Period of Performance: Oct. 1, 2015 – Mar. 31, 2017

Grant Description:

MIID works with smallholder farmers in six villages in Southern Shan to produce ginger, ground nuts and bamboo. Objectives of grant-funded work include: 1) increase the income of participating households by 25 percent over the course of 18 months; 2) build strong, gender-balanced farmer associations with representation in each village connected to regional and national associations; and 3) improve farmers’ knowledge of value chains, trade and agriculture practices. MIID’s interventions also will facilitate knowledge sharing, improved market understanding and private sector engagement, and includes outreach to distant households outside of central village areas.

Grantee: MCG

Period of Performance: Nov. 25, 2015 - Nov. 24, 2017

Grant Description:

MCG received an in-kind grant, comprised of coffee processing equipment, to offset the cost of upgrading their new coffee processing facility in Pyin Oo Lwin to meet international standards, and to support smallholder growers by bringing them into the commercial value chain. Two sets of coffee cupping lab equipment were procured for MCG for use at their Pyin

⁴⁶ This 30-second video PSA was developed by Internews, AMIA and VC-RD, and reviewed by two pesticides safety experts. It began airing on MRTV as a public interest advertisement, in June 2016: please see <https://www.facebook.com/amiamyanmar/videos/1060314377387391/>. This PSA is believed to be among the first in Burma advocating safe/responsible use of agriculture inputs.

Oo Lwin facility and new Ywangan satellite procurement office, which was established in December 2015 to facilitate the purchase of smallholder-grown coffee throughout harvest season. In addition, the grant funded a coffee dry mill, installed at the MCG plant in September in Pyin Oo Lwin. The mill includes hulling, cleaning, sorting, and grading equipment, as well as a recirculation pump to reduce the volume of water used during wet milling and ensure cleaner water is used during washed and semi-washed processing.

Grantee: MFVP

Period of Performance: Dec. 15, 2015 - June 15, 2017

Grant Description:

This grant enables the association to expand its work with watermelon and muskmelon farmers in the Sagaing area (Dry Zone) to achieve the following:

- Train at least 1,500 farmers in appropriate farm management and disease control techniques using "GAP";
- Reduce pre- and post-harvest losses by 10 percent compared to baseline losses;
- Develop at least three market linkages with new international clients;
- Increase gross margins for melon producers by 20 percent over LOP;
- Increase annual incremental sales for targeted beneficiaries by at least 10 percent; and
- Increase MFVP's capacity to manage value chain programs (with sufficient management and financial skills to implement similar projects in collaboration with its members).

Grantee: SARA (with partner TAG Myanmar)

Period of Performance: March 3, 2016 – March 2, 2018

Grant Description:

SARA is the primary grantee with TAG Myanmar providing technical assistance, financial management and capacity building to SARA throughout the period of performance. The project targets 3,100 smallholder farmers in Magway, and aims to:

- Improve the quality and quantity of sesame yield by 15 percent through the introduction of improved technology, crops management, climate-adapted agriculture, and integrated beekeeping;
- Reduce the amount of sesame lost post-harvest by 25 percent through the introduction of simple post-harvest solutions and training;
- Raise the price smallholder farmers receive for sesame by facilitating direct linkages with domestic and international buyers and strengthening farmers' bargaining position and business skills, with special focus on women farmers; and
- Train 1,800 farmers and ensure that 3,100 farmers experience increased sesame yield.

Grantee: Ywangan Amayar Company

Period of Performance: Sept. 19, 2016 – Sept. 18, 2018

Grant Description:

An in-kind grant will assist Amayar to invest in developing a centralized processing facility for wet and dry processing in Ywangan to appeal to buyer preferences. This grant will be used to purchase required equipment for wet and dry



In Y2 the project procured a state-of-the-art coffee dry mill to assist lead firm, MCG, to process higher-quality coffee, including cherries from smallholders. Additional mill machinery for processors in Shan had been ordered through the grants program by the end of Y2.

processing. Both processes require quality control throughout each step in the process. Environmental conditions and village access will influence use of either the wet or dry processing method. Remote villages will be trained in the dry method and use of drying tables. Easily accessible villages will provide cherries for the wet process through a daily collection. The wet process also will be used during colder times of the year. Through this project Amayar will achieve the following:

- At least 1,400 smallholders from 16 villages will be trained to produce specialty coffee. Job opportunities will be created for at least 600 individuals during the coffee harvesting and processing season which will also increase income;
- A wet and dry mill will be located and operational in the coffee growing region of Ywangan Township in Southern Shan, with expected output after the first year of operation: about 100 tons of coffee cherries, purchased and processed to produce 20 tons of green coffee; and
- Establishment of a sustainable long-term business for local, indigenous smallholders with higher prices paid to specialty coffee growers.

Grantee: Lilypad Company, LTD

Period of Performance: Oct. 1, 2016 – Sep. 30, 2018

Grant Description:

Lilypad received an in-kind grant to assist with developing a centralized coffee processing facility in Pinlaung for wet and dry processing, to appeal to buyer preferences. Equipment provided through the grant includes a wet mill, dry mill and coffee dryer, and coffee laboratory equipment for quality assurance. Through this project, Lilypad will achieve the following:

- At least 2,400 smallholder individuals trained in farm layout and plant care, best practices and optimized cherry picking, handling and drying;
- A wet and dry mill will be located and operational in the coffee region of Pinlaung Township in Southern Shan, with expected output by the end of the first year at 100 tons of coffee cherries purchased and processed to produce 20 tons of green coffee;
- A small farm resource center and model coffee farm in the Pinlaung Township that includes plot layout, coffee contour planting, hedge tree planting, and soil preparations; and
- A sustainable long-term business for local, indigenous smallholders with higher prices paid to the specialty coffee growers themselves.

Three additional Innovative Grant applications (in the soybeans and ginger value chains) submitted by private sector firms remained under review as of the end of Y2.

ROLE OF VOLUNTEERS

Over VC-RD's LOP, Winrock will field volunteers to provide 80 person-months of *pro bono* expertise to farmer groups, small- and medium-scale agribusinesses and CBOs. Assignments may be used to improve farmer productivity and profitability, diversify production and processing, improve access to quality and affordable inputs, and improve food security and nutrition. As of September 30, 2016, the project had fielded 13 volunteers (including eight in FY 2016). These volunteers provided a wide array of support, including technical assistance related to coffee, safe/responsible use of pesticides, media and outreach, and coffee cupping competition judging. With the addition of two new value chains (melons

and sesame) and expansion into the Dry Zone in mid-FY 2016, VC-RD is set to increase its utilization of volunteers in Y3-Y5. Please see Table 7, below for details:

Table 6: VC-RD Volunteers LOP

Associate Award Reporting for Leader Award Annual Reports -Burma Value Chains for Rural Development Project																	
	No. of Volunteers			Number of Volunteer Days Completed	Persons Directly Assisted			Persons Trained			Host Institutions						
	M	F	Total		M	F	Total	M	F	Total	C = Cooperatives and Associations	F = Individual Private Farmers	P = Other Private	N = Non-Profit, Public Interest NGOs	E = Public and Private Education Institutions	R = Rural Financial Institutions	G = Public Sector Technical Agencies
Y1 (Oct 2014 - Sept 2015)	4	1	5	91	201	81	282	201	81	282	1			1			2
Y2 (Oct 2015- Sept 2016)	5	3	8	64	50	109	159	50	109	159	1		1	1			3
Y3																	
Y4																	
Y5																	
LOP Total	9	4	13	155	251	190	441	251	190	441	2	0	1	2	0	0	5

ENVIRONMENTAL IMPACT

The project Environmental Mitigation and Monitoring Plan (EMMP) was completed in Q3 of Y1 and submitted as Annex 2 of the Q3 FY 2015 Progress Report. The EMMP was approved by USAID in Q4 of FY 2015. Key elements from the EMMP will be incorporated into trainings so that participants are fully aware of environmental impact implications of the work. VC-RD will continue to monitor all project activities to ensure no advance environmental impacts.

PROBLEMS, DELAYS, CONDITIONS, AND CONSTRAINTS THAT MAY ADVERSELY AFFECT THE IMPACT OF THE PROGRAM

The project experienced no significant problems that adversely impacted the program during Q4. No significant security issues hindered project activities. The project continued to closely monitor occasional reports of conflict between armed ethnic groups and Burma's military in areas well to the east of Taunggyi and in Northern Shan. All VC-RD program officers, consultants and volunteers are provided security and culture briefings upon entry to Burma and are kept apprised of security advisories, weather conditions, anticipated road closures, checkpoints, or other issues.

PLANS FOR Q1 OF FY 2017 (SAMPLE)

Plans for Q1 of FY 2017 are listed below. For more details, please refer to the Year 3 Annual Work Plan.

Coffee

- ✓ Assistance to smallholders in identifying and securing financing/operating capital to expand specialty production of sundried natural coffee to a total of 23 villages in Ywangan Township;
- ✓ Conduct farmer trainings focused on washed (wet) processing best practices including sourcing, fermentation, mucilaging, water management and recycling, and quality control;
- ✓ Develop in-country Q cupping capacity to promote quality and develop local expertise and capacity; conduct brewing/barista training for the retail industry.

Soy

- ✓ Coach lead farmers to organize and deliver monsoon FFD follow-up sessions in their villages;
- ✓ Identify drying technology and demonstrate plant drying in irrigated soybean locations (Humsee, Mong Pone, Mong Nai and Lawksawk) and rain-fed soybean area (Laihka);
- ✓ Facilitate linkages between the national level (Mandalay and Rangoon) seed laboratory and lead seed multiplication firms in certifying, labeling and packaging their seed in Southern Shan.

Ginger

- ✓ Facilitate linkages with international funders/grant programs with potential processors;
- ✓ Facilitate and incentivize private firms to set up initial sorting, washing, slicing and drying equipment at village level.

Sesame

- ✓ Conduct TOT on safe use, handling and storage of pesticides to extension staff from SARA, input suppliers/retail shops and partner organizations;
- ✓ Organize food safety trainings (HACCP) for oil expressers and snack manufacturers.

Melons

- ✓ Finalize volunteer assignment focusing on melon production;
- ✓ Meet with Muse border agents to assess and begin designing technical support for facility upgrades.

Other

- ✓ Finalize pending grant applications, likely to be the final grants issued by the project;
- ✓ Work with mobile application developers to implement a mobile phone-based extension pilot working with trainers in one or more of the project's value chains;
- ✓ Continued production and dissemination of extension and outreach videos and other products via radio, television, online (social media) and traditional media;
- ✓ Work with Internews and AMIA to support AMIA's sustainability for continued distribution of agriculture news and market information;

- ✓ Conduct household financial methodology and gender awareness trainings in the coffee value chain (with CQI and volunteers);
- ✓ Support continued volunteer engagement, including for a team of students from George Washington University's International Development Studies program to conduct an assessment of the project's varying extension approaches in each value chain, for the purpose of knowledge development and sharing.

ANNEX A: SUCCESS STORIES

SOMETHING GOOD IS BREWING IN BURMA

When Winrock International's Farmer-to-Farmer program invited Rick Peyser, a volunteer expert from Vermont's Green Mountain Coffee, to visit Burma's coffee farms in late 2013, few people knew coffee was grown in "the land of a million pagodas." The country's love affair with tea is unrivaled, and it seemed a stretch to think coffee could help subsistence farmers improve incomes and contribute to economic growth in a nation just emerging from decades of isolation.

Yet thanks to the hard work of Burma's motivated smallholder coffee farmers supported by technical and market linkage help from USAID, just two years after Peyser's visit, Burma's previously unknown coffee is now squarely on the world map as a new, up-and-coming coffee origin. Small-scale coffee farmers are embracing simple but innovative practices to boost yields and quality including composting and careful pruning, selective harvesting, use of drying tables and sundried natural processing techniques.

The effort and new focus on quality is paying dividends. In July 2016, 36 MT of *Coffea Arabica* traveled to the U.S. on a pair of cargo vessels in the first-ever shipment of smallholder community-grown coffee from Burma to North America, purchased by a Seattle importer. Another shipping container of coffee from the 2015/16 harvest went to a buyer in Switzerland and two more went to Taiwanese traders. Burma's Arabica is now fetching prices up to two times higher than before, as smallholder farmers in remote Southern Shan State compete in the lucrative global specialty coffee market for the first time in history.

In the run up to the 2015/16 coffee harvest, USAID's Value Chains for Rural Development project, implemented by Winrock International, worked intensively with five coffee producing villages in Southern Shan in a pilot effort to produce specialty grade, sundried natural coffee under the supervision of Winrock's technical team, supplemented by advice from volunteer coffee agronomists and experts from the U.S. Earlier in the year, the project facilitated a buyers' trip for a group of global importers/roasters from the U.S., New Zealand and the United Kingdom. The buyers were invited based on their interest in developing direct-trade relationships with community-based producers to support sustainable economic growth.



After meeting Burma farmers and tasting samples of the coffees produced by the communities – as well as an additional coffee community that heard about the work of the other five and committed to growing specialty coffee in the same manner -- one of the buyers moved quickly to purchase nearly all their volume, for a total of just under 10 MT. The buyer combined the purchase with 26 MT of good quality coffee grown on larger estates in the Pyin Oo Lwin area, or enough to fill a pair of shipping containers. In August of 2016, Burma coffee grown by smallholders was served by baristas in high-end cafes in cities such as Washington, D.C., Austin, TX, New York and Boulder, CO, where it earned rave reviews.

In the upcoming harvest, the Value Chains project is expanding its specialty coffee production pilot **to a total of 23 villages**, including all five of those from the 2015/16 trial.

"If we could continue to sell coffee at the same price as this year, people from our village will increase their income and their livelihoods will be improved," said Zaw Lin Htet, a lead coffee farmer from Mya Ze Di, one of the participating smallholder coffee communities. "It will help develop our village," he said, explaining that most communities in the Shan highlands are responsible for handling – and funding -- their own public infrastructure improvements including roads, schools and water/irrigation resources.

IMPROVING ACCESS TO AGRICULTURE AND MARKET INFORMATION, ONE SHOW AT A TIME

A carefree farmer in flip-flops and short sleeves sprays his crops with insecticide. In the next field over, he sees another farmer wearing the correct personal protective equipment, and realizes he is exposing himself to danger. Inspired, he puts on boots, long-sleeved shirt, gloves, facemask and hat: Lesson learned.

This simple Public Service Announcement (PSA), thought to be one of the first agriculture-themed PSAs in Burma, began airing in August 2016 on a national television news station multiple times each day, reaching an estimated 80 percent of the country's population. In Burma, where agriculture is a mainstay of the economy, information on safe and effective agricultural practices is in short supply, but high demand, as the young "farmer" in the PSA – independent journalist Phyo Lwin Aung – is discovering.

Phyo works for the Agriculture Market Information Agency (AMIA) with a team of six freelance Burmese journalists who interview smallholder farmers, processors, market and retail representatives and agriculture experts to develop stories for *Happy Agri in the Golden Land*, a 25-minute agriculture news and market information show aired on local radio station Shwe FM. The show recently increased its production to feature stories on a new crop or agriculture issue every week, in addition to up-to-date agriculture market information on a range of specialty and commodity agriculture products, as well as question and answer session with agricultural experts. The program was developed in collaboration with Shwe FM with technical and production advice from Internews, a partner of the USAID-funded Value Chains for Rural Development project.

The innovative radio program, as well as the first-ever "responsible use of agriculture inputs" PSA, is part of a larger effort supported by the Value Chains project to develop and circulate audio, video, print, and online coverage of new farming practices/technology and market information. Such information can be difficult for many in Burma to obtain, especially smallholder farmers, who may only have access to radio. Since February of 2016, AMIA has successfully produced 24 *Happy Agri* radio feature shows, spotlighting market trends and challenges in a range of products from specialty coffee and tea to sesame, melons, ginger and soybean, as well as commodity crops including rice, sugarcane and green grams. With guidance from Internews and support from the Value Chains project, AMIA also collects and distributes weekly agriculture market price data through national print, television and radio outlets, as well as via several online news or information services, and has distributed more than 2,000 market information reports (featuring current price data on as many as 30 different food or specialty crops) since 2014 to address the lack of independently sourced agriculture market/price data available to farmers in Burma.



Part of AMIA's success hinges on recognition that for smallholder farmers and other agriculture value chain stakeholders to find important information, they must have access to both traditional (FM radio, newspapers/journals and TV) and new media (online and mobile) to keep up with and potentially penetrate new markets. The telecommunications industry is growing rapidly in Burma, and the proliferation of mobile phones also has popularized social media – in particular, Facebook, which *Happy Agri* listeners are increasingly using. The show's contributors now regularly communicate with listeners via AMIA's Facebook page, which has received more than 6,000 likes; listeners also can post questions there for agriculture experts to answer on-air and off. For example, U Soe Thwin Oo Maung, who contributed to a *Happy Agri* episode on green gram (mung bean), said he received many phone calls and questions from green gram farmers from Magway, Rangoon and Sagaing regions after the program aired.

Happy Agri's success has attracted interest from advertisers, with an agriculture inputs supplier sponsoring the show's first year, and mobile media companies are exploring working with AMIA to disseminate market information, demonstrating growing demand for agriculture news and market trends that can support inclusive agricultural growth in Burma.